# KPDES FORM SDAA

## Kentucky Pollutant Discharge Elimination System (KPDES)

### Socioeconomic Demonstration and Alternatives Analysis

The Antidegradation Implementation Procedure found in 401 KAR 10:030, Section 1(3)(b)3 requires KPDES permit applications for new or expanded discharges to waters categorized as "Exceptional or High Quality Waters" to conduct a socioeconomic demonstration and alternatives analysis to justify the necessity of lowering local water quality to accommodate important economic or social development in the area in which the water is located. This demonstration shall include this completed form and copies of any engineering reports, economic feasibility studies, or other supporting documentation

**I. Project Information**

**Facility Name: Pine Branch Coal Sales Inc. ( Ky. DNR permit # 897-0271 Amendment #7)**

| **Location: 2 miles North of Chavies Ky. On Grapevine Creek** | **County: Breathitt/Perry** |
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**Receiving Waters Impacted: Leatherwood Creek of Troublesome Creek, Caney Creek and Saw Branch of Grapevine Ck.**

**II. Socioeconomic Demonstration**

1. **Define the boundaries of the affected community:**
(Specify the geographic region the proposed project is expected to affect. Include name all cities, towns, and counties. This geographic region must include the proposed receiving water.)

The proposed amendment is located in the Eastern Coal field Region in Central Appalachian Region in Breathitt and Perry Counties two (2) miles North of Chavies Ky. On Grapevine creek. The receiving streams will be Leatherwood Creek of Troublesome creek, Caney Creek and Sawmill Branch of Grapevine creek. Perry and Breathitt counties will be affected, The city of Hazard, The town s of Chavies, Grapevine and Krypton in Perry County, The city of Jackson and the community of Haddix in Breathitt County.
The project lies on the Krypton and Haddix Quadrangles.

2. **The effect on employment in the affected community:**
(Compare current unemployment rates in the affected community to current state and national unemployment rates. Discuss how the proposed project will positively or negatively impact those rates, including quantifying the number of jobs created and/or continued and the quality of those jobs.)

The unemployment rate for Breathitt county is 10.7% compared to the state average of 11.2% and the national average of 10.2 %. While Perry county's average stands at 12.5%. This project will positively affect as many as 15 new people by creating new jobs and save 150 present employees; indirectly this would affect an additional 350 jobs in the support industry. The continuation of this job will help maintain the employment numbers and aid in raising them. If these jobs are lost, there would be a detrimental effect on the people causing a drastic rise in unemployment rates in the area. By continuing these jobs will insure that these employees won't become part of that number. Of the jobs in the area 13.3% are mine related jobs that pays an average $55,000 a year.

## II. Socioeconomic Demonstration- continued

**3. The effect on median household income levels in the affected community:**
(Compare current median household income levels with projected median household income levels. Discuss how proposed project will positively or negatively impact the median household income in the affected community including the number of households expected to be impacted within the affected community.)

According to the US Census Bureau for 2007, The median household income for Breathitt County is $25,577 as compared to the state and nation respectively, $40,299 and $50,740. The anticipated median income for the miners is $55,000 a year compared to the average median income of $25,577 which would increase the economy and workers substantially. This operation will positively affect the local community and business. There will be 150-160 workers affected by this operation in the area. Also affected will be approximately 350 other households will be affected that work in the support industry for the coal business.

**4. The effect on tax revenues of the affected community:**
(Compare current tax revenues of the affected community with the projected increase in tax revenues generated by the proposed project. Discuss the positive and negative social and economic impacts on the affected community by the projected increase.)

The main tax revenue regarding coal mining is the coal severance tax for the leading coal counties in Kentucky. Breathitt and Perry counties are leading counties that would serve to gain from more coal being produced in the communities. Based on 2007 numbers, Breathitt County's Gross Value of Severed Coal was $146,927,408 and Perry County's was $435,106,046. This would put Breathitt and Perry counties it the leading coal producing counties. The money generated by the coal severance tax goes back in the communities for road repair, education, sewer and water projects, etc. The Kentucky coal severance tax is 4.5% of the sales. A Coal Excise Tax is imposed on domestically produced coal. The taxes collected from the coal being produced will be deposited to the Black Lung Disability Trust Fund to finance payments of black lung benefits to afflicted miners. This excise tax is $1.10/ton. This amendment area to the permit will produce an estimated 41,431,895 tons of coal. There is also a reclamation tax that is applied to the amount of coal removed from the mine site. That rate is $0.35/ton of coal that is produced.
The following numbers are based on coal currently being at $50/ton and the estimated coal produced from this amendment area being 41,431,895 ton.

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|---|---|---|
| **Ky Severance Tax at 4.5% of sales** | **=** | **$ 93,221,764** |
| **Federal Excise Tax at $1.10/ton** | **=** | **$ 45,575,085** |
| **Reclamation Tax at $0.35/ton** | **=** | **$ 14,501,163** |

**This is not counting all the local taxes, properly taxes and school taxes These will further more capital for more development projects to serve to improve livelihood in the county.**

## II. Socioeconomic Demonstration- continued

**5. The effect on an existing environmental or public health in affected community:**
(Discuss how the proposed project will have a positive or negative impact on an existing environmental or public health.)

The proposed project area has been previously mined (pre-law) and timbered with little reclamation at the time of mining. Benches and highwalls were left and roads from the timbering operation, these areas have naturally revegetated. The area will be reclaimed during and after mining which will provide an enhanced habitat and environment. During reclamation all permitted areas will be established to be stable and prevent erosion. Species indigenous to the area will be planted to establish adequate vegetation and runoff from all regarded areas. All areas will be diverted into sediment ponds to prevent sedimentation of the streams. Following reclamation, the area will be in better condition than existed prior to the mining. This will provide a healthier habitat for aquatic species and wildlife leading to a more balanced ecosystem. By mining the coal in the area will increase severance tax revenues as previously discussed which is returned to the community. These monies can be and usually are used for environmental projects such as sewage disposal and treatment, sanitation, solid waste disposal helping to eliminate such things as straight pipes in the streams and illegal dumping which will have beneficial effects on the existing environment.

**6. Discuss any other economic or social benefit to the affected community:**
(Discuss any positive or negative impact on the economy of the affected community including direct and or indirect benefits that could occur as a result of the project. Discuss any positive or negative impact on the social benefits to the community including direct and indirect benefits that could occur as a result of the project.)

This project will provide employment for the area at a higher than average wage and will create additional revenue for the existing businesses in the surrounding communities. The additional and continuing revenue created by this operation for the local businesses and the severance dollars generated by this operation, will provide the local governments increased benefits in public safety (law enforcement, fire protection, ambulances, etc) and also aid industrial and economic development in the surrounding communities.
The facility will continue to provide employment an to estimated 150-160 workers during the life of the mine. The project will also provide many additional jobs in other sectors of the economy, such as trucking, fuel, transportation, engineering to name a few. The mining operations positively affect the local economy more than other industries. This surface mining method is the most efficient and economical plan for recovery of the coal associated with this project. This method allows for the maximum removal of the coal reserves, and prevents future mining of the area will increasing the amount of tax dollars that contribute to the state and local economies. Upon final reclamation and closing of the job the reclamation has the potential of enhancing the habit and increasing tourism to the area.

## III. Alternative Analysis

**1. Pollution prevention measures:**
(Discuss the pollution prevention measures evaluated including the feasibility of those measures and the cost. Measures to be addressed include but are not limited to changes in processes, source reductions or substitution with less toxic substances. Indicate which measures are to be implemented.)

Alternative processes and options analyzed include:

A sand filter was an option that was looked at but was ruled out because they are not very effective at removing very fine sediment and clay and would have to be back flushed continually, thus costing additional monies. And would not be effective at handling the large volume of water during a heavy storm event. The estimated capital construction cost of an on-site package treatment plant similar to that used for treatment of domestic sewage is $300,000. Also after the operation is complete an additional $150,000 would be added for removing and disposing of the unit. Other methods of mining were considered however, The area is not large enough to justify the cost of opening and maintaining an underground operation. Also multiple openings, roads and support areas would have to be constructed, at least one (1) for each seam. These areas would remain open and unreclaimed for the life of the operation causing greater runoff and more pollution. Surface contour and auger operation was also evaluated. This method of mining would require multiple benches for the different seams which would remain open and unreclaimed for a greater period of time and would create steeper slope when reclaimed resulting in greater runoff and erosion. Both these methods would not recover all the coal which could result in possible future remining of the area, which would cause additional disturbance of the area and more pollution in the future. Approximately $1,000,000 of additional cost would be incurred with both methods. Additionally at least 1,151,842 tons of coal would be lost with either of these two methods of mining resulting in the loss of $69,110,520 in revenue and $575,920 in coal severance tax that would be coming back to the community.

**2. The use of best management practices to minimize impacts:**
(Discuss the consideration and use of best management practices that will assist in minimizing impacts to water quality from the proposed permitted activity.)

The project will implement the Best Management Practices for mining operations in Kentucky. The runoff and sediment control strategies were preplanned. All Sediment Structures were sized to accommodate a 25 Yr 24Hr storm event. Also ponds will not be placed in sites with steep topography or in buffer areas.
Existing vegetation will be retained where it is feasible. A naturally vegetated buffer will be provided adjacent to streams, ditches or drainage, consisting of trees, shrubs, and grasses, or other herbaceous species to protect surface water from soil runoff and mining contaminates.
BMP structures will be inspected within 24 hours of each significant rainfall event and corrective action taken immediately, if erosion or soil runoff is observed. Runoff will be diverted away from any disturbed areas to prevent any adverse effect to water quality as a result of increase in turbidity or total suspended solids. All disturbed areas which are not being mined will be vegetated and mulched. Local materials and native species will be used for reclamation. Any work that results on exposed earth on slopes leading to wetlands or surface water during periods when significant rainfall is not predicted and all sediment should be trapped onsite.
With the conclusion of mining, the area will be reclaimed. Any affected streams will be stabilized and restored, and a riparian buffer will be established. These rehabilitated streams will curb sedimentation and provide a habitat for aquatic species and wildlife. Until approval from KDNR, various sediment and treatment will remain. Discharge will be treated as necessary and practical, to ensure that water leaving the permit is within water quality standards.

3. **Recycle or reuse of wastewater, waste by-products, or production materials and fluids:**
(Discuss the potential recycle or reuse opportunities evaluated including the feasibility of implementation and the costs. Indicate which of, of these opportunities are to be implemented)

Water recycling and reuse will be utilized to the extent possible. Water recycling options include dust suppression on haul roads and in revegetation efforts (e.g. hydroseeding). Water will be recycled for these uses as needed rather than seeking other sources of water; however, the volume of water required for these uses is minimal (estimated 5%) compared to the total volume anticipated to be generated by the watershed. The greatest discharge would be during heavy periods of rainfall and storm events. Other alternates looked at was the possibility of the residents reusing the water for livestock and irrigation of crops. However this would have a minimal effect because of limited livestock in the area and irrigation would be seasonal. During a 10 Yr. 24 Hr. storm event 83,405,255 GPD of water would have to be reused or recycled to prevent any discharge. We will try to implement all these options. In the revegetation process the regrade backfill is above 6% and reusing water in this process would create erosion and additional sedimentation.

Non-coal waste will be placed and temporarily stored in a controlled manner on a portion of the permit area designated by the operator. Waste such as Tires, old equipment pars, etc will be stored then removed from the job for recycling. Placement and storage procedures will ensure that leach ate and/or surface runoff will not degrade surface or ground waters. All liquid waste will be temporarily stored and disposed of in metal containers an sent to recycling centers. Fires will be prevented. The area will remain stable and suitable for reclamation and revegetation. Final disposal of non-coal waste will be at a state-approved landfill or recycling plant. The cost for the storage and removal are built into the mining and reclamation cost.

## III. Alternative Analysis - continued

**4. Application of water conservation methods:**
(Discuss the potential water conservation opportunities evaluated including the feasibility of implementation and the costs. Indicate which of, of these opportunities are to be implemented)

My water conservation methods that will be used for the operation include on-site water distribution, which is limited to watering haul roads for dust suppression, hydroseeding for reclamation, and watering of reclaimed areas during dry periods. These re-use techniques would cost approximately $150,000 per year. These methods will be implemented for this operation. Another method that could be implemented is for the use fire prevention and suppression for the surrounding communities through the use of the water stored in the sedimentation ponds.

**5 Alternative or enhanced treatment technology:**
(Compare feasibility and costs of proposed treatment with the feasibility and costs of alternative or enhanced treatment technologies that may result in more complete pollutant removal. Describe each candidate technology including the efficiency and reliability in pollutant removal and the capital and operational costs to implement those candidate technologies. Justify the selection of the proposed treatment technology.)

Alternative processes and options analyzed include:

A sand filter was an option that was looked at but was ruled out because they are not very effective at removing very fine sediment and clay and would have to be back flushed continually, thus costing additional monies. And would not be effective at handling the large volume of water during a heavy storm event. The estimated capital construction cost of an on-site package treatment plant similar to that used for treatment of domestic sewage is $300,000. Also after the operation is complete an additional $150,000 would be added for removing and disposing of the unit. An underground treatment facility such as a sewage septic system was given consideration. Enough systems would have to be constructed to control in excess of 83,405,255 GPD of water during a 10 yr 24 hr storm event. If a large enough area were available for the construction of such a facility the surface disturbance created by the construction would be nearly as large as the mining operation itself. By using 10,000 gallon tanks in the construction of these systems 8340 systems would be needed to handle the volume of water from the operation. The cost of these systems would be approximately $20,850,000. Since tanks and field drains are designed for Biological waste treatment instead of treatment of sediment these would have to be cleaned and maintained frequently. Cleaning of these tanks would cost $16,680,000 annually. The sediment ponds as a treatment system will be used as the treatment system for this operation. These sediment ponds are the best for treating the removal of sediment from the runoff water by allowing sufficient settling time for the sediment to settle out prior to discharge. The closest treatment works to the project property is in Hazard, Ky. which is approximately 12 miles upstream from the proposed operation. The capital cost to construct a system to transport wastewater from the mine site to the nearest treatment system is estimated to be a minimum of $16.00 per foot

($1,013,760) for laying the waterline, $200,000 each for 6 pump stations , ($1,200,000) $800 each for 60 gate valves ($48,000), Engineering, inspection, permitting, legal and right-of-way acquisition would cost an additional $300,000. Total construction cost would be approximately $2,561,760 plus and the treatment cost would be approximately $263.560 per day during a storm event. Further, the mine site is not within the approved planning area of any wastewater treatment plant. Finally, the nearest wastewater treatment plant located at Hazard has limited capacity and is physically constrained from further expansion.

## III. Alternative Analysis - continued

**6. Improved operation and maintenance of existing treatment systems:**
(Discuss improvements in the operation and maintenance of any available existing treatment system that could accept the wastewater. Compare the feasibility and costs of improving an existing system with the feasibility and cost of the proposed treatment system.)

There are many physical, chemical, and biological treatment options for processing waste water. The proposed treatment would likely fall under the physical treatment category. Water at the proposed project site would likely have elevated levels of suspended solids due to precipitation falling on areas of removed vegetation from to construction and other activities. The sediment basins which are proposed for this site are designed to slow the flow of water and allow these suspended solids to settle out of the water column. This is the same process used at almost all waste water treatment plants and drinking water treatment plants.

Chemical treatment options for this site would likely include some type of flocculent which would increase the speed at which the suspended solids would precipitate out of the water column. This enhanced treatment process would be applicable, however it would still require the construction of a large slow moving body of water, similar to a sediment basin, in which the flocculent would be applied to aid in the treatment of the discharge water. This might cause a more significant decrease in the total suspended, however, it would cost more than the proposed treatment as it would require the creation of sediment basins in addition to the purchase and application of the flocculent. It would require hiring a full time employee or purchasing machinery to apply the flocculent in the proper amounts. Another potential negative effect of this process would be removal of the precipitate which would accumulate on the bottom of the pond. The ponds would need to be dredged and cleaned out at a greater interval. Flocculants could also potentially add contaminants to the discharge water which may need to be removed for compliance with the KPDES permit. This option would be more costly than the proposed treatment options This would add an additional $75,000 to $100,000 dollars a year to the treatment of each structure. Because of this, the proposed option is more feasible.

Another option would be the creating on a biological treatment system to remove the suspended solids. This would again require a slow flowing large body of water to allow the sediments to settle out of the water column. The basin would likely have a larger surface area with a shallower depth to create an environment conducive to growing flora which would serve the purpose of slowing water flow. A shallower basin would need to be dredged at a greater interval to keep the same level of effectiveness. This option again would be more costly than the proposed option as it would still need basins with a need for additional manpower and materials. Because this option would be more expensive, the proposed option is more feasible.

The sediment ponds on site are the water treatment facilities. These structures are designed so that all discharges meet effluent limitations of (0.5ml/L or less). These structures are routinely inspected for sediment capacity and to ensure they are not defective and working properly, and tested for quality of discharging water. These structures are designed and constructed to control the discharge by straight pipes and/or emergency spillways to allow for enough settling time for the sediment solids to settle out before discharge. The discharge rate is dictated by the design spillways. The release of the water is maintained by natural displacement not mechanical release. These ponds are designed to maintain a 10 Year/24 Hour storm event to meet effluent and the runoff of a 25 Year/24 Hour storm event. When these treatment facilities reach their designed cleanout level they are cleaned and maintained. Cleaning of these structures cost approximately $10,000 per pond. Since these structures perform as designed to sufficiently treat the runoff this is the option we are implementing.

7. **Seasonal or controlled discharge options:**
(Discuss the potential of retaining generated wastewaters for controlled releases under optimal conditions, i.e. during periods when the receiving water has greater assimilative capacity. Compare the feasibility and cost of such a management technique with the feasibility and cost of the proposed treatment system.)

For a coal mining operation sediment structures are required, designed and constructed to control both the sediment load and surface runoff from the area. These structures are designed and constructed to control the discharge by straight pipes and/or emergency spillways to allow for enough settling time for the sediment solids to settle out before discharge. The discharge rate is dictated by the design spillways. The release of the water is maintained by nature not mechanical release. These ponds are designed to maintain a 10 Year/24 Hour storm event to meet effluent and the runoff of a 25 Year/24 Hour storm event. These structures are designed and built for controlled release and to ensure downstream safety. To retain all the runoff during a storm event would require the construction of a large number of additional ponds or triple in size, which would require approximately $10,000 per additional pond. An underground storage facility such as a sewage septic system was given consideration. Enough systems would have to be constructed to control in excess of 83,405,255 GPD of water during a 10 yr 24 hr storm event. If a large enough area were available for the construction of such a facility the surface disturbance created by the construction would be nearly as large as the mining operation itself. By using 10,000 gallon tanks in the construction of these systems 8340 systems would be needed to handle the volume of water from the operation. The cost of these systems would be approximately $20,850,000.

## III. Alternative Analysis - continued

**8 Land application or infiltration or disposal via an Underground Injection Control Well**

(Discuss the potential of utilizing a spray field or an Underground Injection Control Well for shallow or deep well disposal. Compare the feasibility and costs of such treatment techniques with the feasibility and costs of .proposed treatment system.)

Subsurface disposal is not possible due to the lack of underground cavities (i.e. abandoned underground mine works) in the vicinity of the project. The nearest underground cavity is seven (7) miles away. Underground injection into old works would result in the water not being treated as efficiently. Therefore the water or streams possibly could receive more pollutants because of blowouts or unknown seeps, which would not be treatable. A spray field would not serve any purpose, they would not do anything to control or treat the sediment and the water will eventually flow into the stream after all. The cost for this would be large and not be of any benefit.

**9 Discharge to other treatment systems**

(Discuss the availability of either public or private treatments systems with sufficient hydrologic capacity and sophistication to treat the wastewaters generated by this project. Compare the feasibility and costs of such options with the feasibility and costs of the proposed treatment system.)

Alternate treatment works have been investigated, including piping and trucking the discharge to the nearest water treatment plant. The closest treatment works to the project property is in Hazard, Ky. which is approximately 12 miles upstream from the proposed operation. The capital cost to construct a system to transport wastewater from the mine site to the nearest treatment system is estimated to be a minimum of $16.00 per foot ($1,013,760) for laying the waterline, $200,000 each for 6 pump stations , ($1,200,000) $800 each for 60 gate valves ($48,000), Engineering, inspection, permitting, legal and right-of-way acquisition would cost an additional $30 In addition, the wastewater treatment plant would charge an estimated $3.16/per thousand gallons to treat the wastewater coming from the mine. Total construction cost would be approximately $2,561,760 plus and the treatment cost would be approximately $263.560 per day during a storm event. Further, the mine site is not within the approved planning area of any wastewater treatment plant. Finally, the nearest wastewater treatment plant located at Hazard has limited capacity and is physically constrained from further expansion. There is no room for the city to construct a sediment pond needed to treat effluent from this water, since the treatment plant is for treating biological waste and not sediment and reducing effluent. Another option of transporting the water to the treatment plant would be by trucking it, However, to truck the 83,405,255 GPD of water that would have to be generated by a 10 Yr 24 Hr. storm event 695 Ten thousand gallon tanker trucks would have to be used, hauling 24 hours a day at an initial cost of ($139,000,000), working 8 hour shifts these trucks would need 2,085 drivers at $20 per hour the cost for the drivers would be $333,600 per day, the fuel cost for these trucks per day will be $128,436.

**IV Certification:** I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

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| **Name and Title:** | Ron Turner Secretary | **Telephone No.:** | (606)436-3712 |
| **Signature:** |  | **Date:** | 3/04/2010 |